Description of Risk Factors for (HDL-c) on Iraqi Children with a Heart Structure Problem at Birth

Dr. Ahmed Mahdi Hussein[1], Dr. Hussein Neamah Ubaid[2], Dr. Haider M. Hussein Kufi[3] and Dr. Ali Qais Abdulkafi[4]

[1]M.B.Ch.B. \ F.I.B.M.S. \ C.A.B.P. \ (Pediatrics), Ministry of Health, Kurdistan Region, Iraq, Sulaymaniyah Health Directorate, Dr. Jamal Ahmed Rashid Pediatric Teaching Hospital, Sulaymaniyah, Iraq

[2]M.B.Ch.B. \ F.I.B.M.S. \ D.CH. \ (Pediatrics), Iraqi Ministry of Health, Karbala Health Directorate, Karbala Teaching Hospital for Children, Karbala, Iraq

[3]M.B.Ch.B. \ F.I.B.M.S. \ D.CH. \ (Pediatrics), Iraqi Ministry of Health, Karbala Health Directorate, Karbala Teaching Hospital for Children, Karbala, Iraq

[4]M.B.Ch.B. \ D.C.H. \ (Pediatrics), Iraqi Ministry of Health, Kirkuk Health Department, Kirkuk General Hospital, Kirkuk, Iraq

Abstract: This paper aims to describe of risk factors for (HDL-c) on Iraqi children with a heart structure problem at birth and know the type of correlation between variables. A cross-sectional and retrospective descriptive study was conducted in different hospitals in Iraq, from January 2020 to January 2021, for children aged 5 to 15 years. In this study, 130 children were collected from different hospitals in Iraq Baghdad and were distributed into two groups (a patient group for 70 patients) and (a control group for 60 patients), and the ages of the children in this study ranged from 5 to 15 years. The most common risk factors in this group of conditions were family history, high cholesterol, and heart structure problem. The results which found in this study. Decrease in patient outcomes according to HDL-C with 30.1 ± 1.9 compared to the control group 44.3 ± 3.8. Where a statistically significant relationship was found between the variables with p value 0.00533, LDL-C mg/dL of group patient (136.5 ± 4.4) as for the control group (116.2 ± 7.2). In the research, we concluded the risk factors were found for LDL–C mg/dL, HDL–C mg/dL, and -cholesterol mg/dL, followed by obesity and lifestyle, where - a statistically significant relationship was found between most of the paragraphs of this study and the causes of death.

Keywords: LDL, HDL, TC, Risk, Patient, Children.

INTRODUCTION

Cholesterol is a primary risk factor for the onset of cardiovascular disease. [Juonala, M. *et al.*, 2009] Several medical studies have confirmed the relationship between increased levels of cholesterol in the blood and the development of cardiovascular diseases resulting from atherosclerosis, such as cerebrovascular disease, peripheral vascular disease, and especially coronary heart disease, as well as a relationship between high cholesterol levels and heart structure problem at birth. [Klag, M.J. *et al.*, 1993; Lee, J. *et al.*, 1986]

Heart structure problem occupies a leading position in the structure of pathology in adults and children and is the leading cause of premature disability and premature death in most economically developed countries [Haney, E.M. *et al.*, 2007; Daniels, S.R. *et al.*, 2008; Kavey, R.E.W. *et al.*, 2006]. According to recent epidemiological studies, there was a significant increase in both normal hypertension (BP) and arterial hypertension (AH) among children and adolescents. [Verheugt, C.L. *et al.*, 2010]

People with congenital heart disease frequently develop diseases such as being overweight, obese, and dyslipidaemia which contribute to an increased risk of cardiovascular disease (CVD). [Xavier, H.T. *et al.*, 2013]

Although some authors have reported a lower incidence of atherosclerotic lesions in adults with DS, which may reduce the risk of coronary events, other reports suggest that these patients have a nearly fourfold higher risk of death from ischemic heart disease and stroke in adulthood from the general population. [Ouimet, M. *et al.*, 2019; Pant, S. *et al.*, 2014]

It should also be noted that cholesterol levels are more important in those who are more susceptible to disease. [Ray, T.D. *et al.*, 2011]

In these cases, the desired level of cholesterol for the patient depends on the cardiovascular risk profile, which may require to be more stringent when looking for a reduction in total cholesterol. [Zaqout, M. *et al.*, 2017]

In those who suffer from it, an increase in plasma lipids rarely produces symptoms or physical signs until atherosclerotic disease or pancreatitis develops; therefore, the diagnosis should be made by performing blood tests on populations at risk of

developing dyslipidemia, such as patients and their first-degree relatives with heart disease at an early age. [Assmann, G. *et al.*, 1993]

The relationship between the level of cholesterol in the blood and coronary atherosclerosis is a gradual one [Nissen, S.E. *et al.*, 2003]. This research we aim to describe the risk factors for (HDL-c) on Iraqi children with heart structure problem at birth in Iraq.

MATERIAL AND METHOD
Collection Sample
A cross-sectional, retrospective study of pediatric patients with HDL-c was carried out in Iraq for the purpose of identifying the risk factors for a heart structure problem at birth in children aged 5 to 15 years who were admitted to different hospitals in Iraq Children, during the study period. From January 2020 to January 2021.

One hundred thirty children were recruited and distributed into two groups (patients 70 children, control 60 children) who entered the time period mentioned above and for whom triglycerides and cholesterol were tested, and they obtained high values.

Study Design
One hundred thirty children were collected based on the presence of risk factors for dyslipidemia, such as a family history of dyslipidemia, being overweight, or hypothyroidism (all tests were routinely performed on an empty stomach).

The study was approved by the Study Nature Ethics Committee

This study was conducted with respect for ethical principles of self-determination and with parental consent. Data were collected from hospital medical records with the following variables: patient name, age, gender, obesity, toxic habits, cholesterol and triglyceride levels, and family history, which were transcribed into a paper Data collection.

Dyslipidemia was defined according to Iraq Health Standards (total cholesterol (TC) $\geq$ 200 mg/dL, HDL-C) <35. (LDL-C) 130 mg/dL, (HDL-C) 40 mg/dL, triglycerides $\geq$ 130 mg/dL

Dyslipidemia is classified as a) Isolated dyslipidemia Finding high TG and low HDL-C, with TC and C-LDL within the normal range.

Statistical Analysis
Categorical variables were described in terms of number and percentage, and numerical variables in terms of median and range. For (HDL-c) on Iraqi children with a heart structure problem at birth

The logistic regression to the analysis risk factor of the study was analyzed, in addition to making the calculations using the SPSS 22.0 program. All p values < 0.05 were considered statistically significant.

AIM OF STUDY
This paper aims to Description of risk factors for (HDL-c) on Iraqi children with heart structure problems at birth and know the type of correlation between variables.

RESULTS
In this study, 130 children were collected from different hospitals in Iraq and were distributed into two groups (a patient group for 70 patients) and (a control group for 60 patients), and the ages of the children in this study ranged from 5 to 15 years. In this study, children were distributed according to gender (78 boys, 52 girls), as shown in Table 1.

Table 1: Demographic results related to the patient (HDL-c) on Iraqi children with a heart structure problem at birth

Variable	Patient group, 70	Control group, 60	P value
Age			
5-9, N (%)	30 (42.8%)	25 (41.67%)	
10-15 N (%)	40 (57.14%)	35 (58.33%)	0.43
Mean ± SD	11.1±2.6	10.4±3.2	
SEX			
Boys	45 (64.28%)	33 (55%)	0.88
Girls	25 (35.7%)	27 (45%)	0.754
comorbidities			
Hypertension	20 (28.57%)	13 (21.67%)	
Diabetes	13 (18.57%)	10 (16.67%)	
Renal failure	11 (15.71%)	9 (15%)	0.984
Obese	8 (11.42%)	6 (10%)	

Hussein, A.M. et al.

Sarc. Jr. med. ser. vol-1, issue-9 (2022) pp-1-5

Other	18 (25.71%)	22 (36.67%)	
Type of congenital heart disease			
Cyanotic	27 (38.57%)	21 (35%)	0.01
A cyanotic	43 (61.42%)	39 (65%)	0.67
Type of cardiac interventional procedure			
Catheterization	17 (24.28%)	16 (26.7%)	0.99
Surgery	53 (75.71%)	44 (73%)	0.59
Hypothyroidism			
Yes	55 (78.57%)	30 (50%)	
No	15 (21.42%)	30 (50%)	0.7543

Table 2: Outcomes of patient study according to the description risk factor

Variable	Patient group, 70	Control group, 60	P-value
TC mg/dL	212±8.8	176±7.9	0.01
LDL-C mg/dL	136.5±4.4	116.2±7.2	0.001
HDL–C mg/dL	30.1±1.9	44.3±3.8	0.00533
Non-HDL-Cholesterol mg/dL	143±5.3	120±8.4	0.08
Triglycerides	166±6.7	145.4± 3.2	0.007
Fasting glucose mg/dL	107.3±5.5	96±4.6	0.05
Diastolic blood pressure	95±5.2	84±3.4	0.03
ApoA–I	108±4.4	122±5.3	0.55

Table 3: Logistic regression to the analysis of the risk factor of the study

Variable	RF (CS95%)	P-value
Age	0.77 (0.3-0.88)	0.44
Type of heart disease	1.2 (0.98-1.44)	0.01
LDL-C mg/dL	2.2 (1.4-5.5)	0.005
HDL–C mg/dL	3.1 (2.4-8.9)	0.001
Non-HDL-Cholesterol mg/dL	1.32 (0.97-1.77)	0.0332
Type of cardiac interventional procedure	2.88 (1.76-4.9)	0.0077
family history	1.5 (1.1-3.8)	0.05

DISCUSSION

A high percentage were found (HDL-c) on Iraqi children with a heart structure problem at birth.

In our study group, approximately 70 patients and 60 control groups.

This frequency is much higher than that reported in the general pediatric population, which ranges from 15 to 30%.

In HDL-c analysis, our results showed similar trends to previous studies where low HDL-C, TG, and TC mg/dL were the most common types of dyslipidaemias. With regard to the clinical characteristics of our study group, a high incidence of hypothyroidism was observed for 55 patients, and for the control group was for 30 children compared to previous studies, where it is estimated at 17 to 35% of affected children according to the study of George Wright in America 2003.

This result can be explained by the fact that our study group was selected from among patients with risk factors for dyslipidaemia.[NHLBI, 2011] It is evident in our results that the presence of each type of dyslipidemia was not associated with nutritional status, similar to the results obtained by Adelekan, *et al.*, [NHLBI, 2011; Aburawi, E.H . *et al*., 2006]

In our study, the frequency of overweight and obesity is relatively low (21.1%), possibly due to strict medical monitoring. On the other hand, it can be suggested that dyslipidaemia is related to some genetic factors that influence cholesterol metabolism. [Hickman, T.B. *et al*., 1998]

In this study, we showed through logistic analysis that there is a direct relationship between heart disease to Iraqi children and the main causes of death in Iraq. The main risk factors appear since childhood as the prevention of traditional risk factors such as obesity, high blood pressure, familial hypercholesterolemia, and diabetes, and their early recognition Intervention with lifestyle

changes and specific measures is permitted. [Garcés, C. *et al*., 2004].

In our study, accepted with many studies such as Goodpaster BH, Krishnaswami S, and Harris TB, an increased risk factor for developing a heart structure problem at birth was found in the future. The Vargas Lönnner 2005 study in Mexico indicates that the number of heart disease events is significantly lower in adolescents than in adults where the type of heart disease, LDL-C mg/dL, and HDL–C mg/dL is associated with a risk factor of the study.

Most of the risk factors affecting children can be controlled in childhood, reducing the risk of cardiovascular disease later in life. [Pillutla, P. *et al*., 2009] Other risk factors are usually transmitted (genetic factors), and in this study, a statistically significant relationship was found between genetic factors and risk factor of study 1.5(1.1-3.8) at p-value 0.05.

CONCLUSION

In the research, we concluded the risk factors were found were LDL-C mg/dL, HDL–C mg/dL, -Cholesterol mg/dL, followed by obesity and lifestyle, where - a statistically significant relationship was found between most of the paragraphs of this study and the causes of death.

In conclusion, our study suggests that screening for dyslipidemia should be undertaken early in all patients with a heart structure problem.

REFERENCES

1. Juonala, M., Viikari, J.S., Rönnemaa, T., Marniemi, J., Jula, A., Loo, B.M. and Raitakari, O.T. "Associations of dyslipidemias from childhood to adulthood with carotid intima-media thickness, elasticity, and brachial flow-mediated dilatation in adulthood: the Cardiovascular Risk in Young Finns Study." *Arteriosclerosis, thrombosis, and vascular biology* 28.5 (2008): 1012-1017.
2. Klag, M.J., Ford, D.E., Mead, L.A., He, J., Whelton, P.K., Liang, K.Y. and Levine, D.M. "Serum cholesterol in young men and subsequent cardiovascular disease." *New England Journal of Medicine* 328.5 (1993): 313-318.
3. Lee, J., Lauer, R.M. and Clarke, W.R. "Lipoproteins in the progeny of young men with coronary artery disease: children with increased risk." *Pediatrics* 78.2 (1986): 330-337.
4. Haney, E.M., Huffman, L.H., Bougatsos, C., Freeman, M., Steiner, R.D. and Nelson, H.D. "Screening and treatment for lipid disorders in children and adolescents: systematic evidence review for the US Preventive Services Task Force." *Pediatrics* 120.1 (2007): e189-e214.
5. Daniels, S.R., Greer, F.R. and Committee on Nutrition. "Lipid screening and cardiovascular health in childhood." *Pediatrics* 122.1 (2008): 198-208.
6. Kavey, R.E.W., Allada, V., Daniels, S.R., Hayman, L.L., McCrindle, B.W., Newburger, J.W., Parekh, R.S. and Steinberger, J. "Cardiovascular risk reduction in high-risk pediatric patients: a scientific statement from the American Heart Association Expert Panel on Population and Prevention Science; the Councils on Cardiovascular Disease in the Young, Epidemiology, and Prevention, Nutrition, Physical Activity and Metabolism, High Blood Pressure Research, Cardiovascular Nursing, and the Kidney in Heart Disease; and the Interdisciplinary Working Group on Quality of Care and Outcomes Research: endorsed by the American Academy of Pediatrics." *Circulation* 114.24 (2006): 2710-2738.
7. Verheugt, C.L., Uiterwaal, C.S., van der Velde, E.T., Meijboom, F.J., Pieper, P.G., van Dijk, A.P., Vliegen, H.W., Grobbee, D.E. and Mulder, B.J. "Mortality in adult congenital heart disease." *European heart journal* 31.10 (2010): 1220-1229.
8. Xavier, H.T., Izar, M.C., Faria Neto, J.R., Assad, M.H., Rocha, V.Z. and Sposito, A.C, et al. "V Brazilian Guidelines on Dyslipidemias and Prevention of Atherosclerosis." *Arq Bras Cardiol*. 101.4-1(2013): 1–20.
9. Ouimet, M., Barrett, T.J. and Fisher, E.A. "HDL and Reverse Cholesterol Transport." *Circ Res*. 124.10 (2019): 1505 - 18.
10. Pant, S., Deshmukh, A., GuruMurthy, G.S., Pothineni, N.V., Watts, T.E., Romeo, F. and Mehta, J.L. "Inflammation and atherosclerosis." *J Cardiovasc Pharmacol Ther*. 19.2 (2014) 170 - 8.
11. Ray, T.D., Green, A. and Henry, K. "Physical activity and obesity in children with congenital cardiac disease." *Cardiology in the Young* 21.6 (2011): 603-607.
12. Zaqout, M., Vandekerckhove, K., Michels, N., Bove, T., François, K. and De Wolf, D. "Physical fitness and metabolic syndrome in children with repaired congenital heart disease

compared with healthy children." *The Journal of pediatrics* 191 (2017): 125-132.

13. Assmann, G., Von Eckardstein, A. and Funke, H. "High density lipoproteins, reverse transport of cholesterol, and coronary artery disease. Insights from mutations." *Circulation* 87.4 Suppl (1993): III28-III34

14. Nissen, S.E., Tsunoda, T., Tuzcu, E.M., Schoenhagen, P., Cooper, C.J., Yasin, M., Eaton, G.M., Lauer, M.A., Sheldon, W.S., Grines, C.L., Halpern. S., Crowe, T., Blankenship, J.C. and Kerensky, R. "Effect of recombinant Apo A-I Milano on coronary atherosclerosis in patients with acute coronary syndromes: a randomized controlled trial." *JAMA* 290.17 (2003): 2292–2300.

15. National Heart, Lung and Blood Institute. "Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents: Summary Report." Pediatrics. 128.5 (2011): S213 – 56.

16. Aburawi, E.H., Grubb, A., Raitakari, O.T., Viikari, J. and Pesonen, E.J. "Lowered levels of serum albumin and HDL-cholesterol in children with a recent mild infection." *Annals of medicine* 38.2 (2006): 154-160.

17. Hickman, T.B., Briefel, R.R., Carroll, M.D., Rifkind, B.M., Cleeman, J.I., Maurer, K.R. and Johnson, C.L. "Distributions and trends of serum lipid levels among United States children and adolescents ages 4–19 years: data from the Third National Health and Nutrition Examination Survey." *Preventive medicine* 27.6 (1998): 879-890.

18. Garcés, C., Gil, A., Benavente, M., Viturro, E., Cano, B. and de Oya, M. "Consistently high plasma high-density lipoprotein-cholesterol levels in children in Spain, a country with low cardiovascular mortality." *Metabolism* 53.8 (2004): 1045-1047.

19. Pillutla, P., Shetty, K.D. and Foster, E. "Mortality associated with adult congenital heart disease: trends in the US population from 1979 to 2005." *American heart journal* 158.5 (2009): 874-879.

Cite this article as:
Hussein, A.M., Ubaid, H.N., Kufi, H.M.H. and Abdulkafi, A.Q. "Description of Risk Factors for (HDL-c) on Iraqi Children with a Heart Structure Problem at Birth." *Sarcouncil Journal of Medical Series* 1.9 (2022): pp 1-5.